BAMBOO-STEM FLIES: AN ANNOTATED KEY TO THE SPECIES OF THE *SOPHIRA* COMPLEX OF GENERA (DIPTERA: TEPHRITIDAE: ACANTHONEVRINI)

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Abstract

Indo-Australian and East Asian fruit flies placed in the *Sophira* complex of genera are reviewed and keyed. The 63 recognised species are referred to 25 genera: *Adramoides* Hardy (1 sp.), *Antisophira* Hardy (1 sp.), *Cleitamiphanes* Hering (1 sp.), *Colobostrella* Hendel, stat. rev. (= *Saucromyia* Hardy, syn. n.) (4 spp); *Colobostroter* Enderlein (1 sp.), *Enicopterina* Malloch (1 sp.), *Exallosophira* Hardy (1 sp.), *Felderimyia* Hendel (3 spp), *Homoiothemara* Hardy (1 sp.), *Kambangania* de Meijere (3 spp), *Langatia* Hancock & Drew (1 sp.), *Loriomyia* Kertész (1 sp.), *Parasophira* Hardy, stat. rev. (1 sp.), *Phorelliosoma* Hendel (6 spp), *Polyara* Walker (3 spp), *Polyaroidea* Hardy (3 spp), *Proptilona* Zia, stat. rev. (= *Heterosophira* Hardy, syn. n., = *Spaniothrix* Hardy, syn. n.) (4 spp), *Pseudacrotoxa* Hering (1 sp.), *Pseudosophira* Malloch (1 sp.), *Robertsomyia* Hardy (1 sp.), *Seraca* Walker, stat. rev. (3 spp), *Soosina* Hering (2 spp), *Sophira* Walker (11 spp), *Terastiomyia* Bigot (3 spp) and *Tritaeniopteron* de Meijere (5 spp). *Proptilona disjuncta* (Hardy), comb. n. and *P. vittata* (Hardy), comb. n. are transferred from *Kambangania* and *P. uncinata* (Hering), comb. n. is transferred from *Acanthonevra* Macquart. *Colobostrella bicolor* (Hardy), comb. n. and *C. spectabilis* (Hardy), comb. n. are transferred from *Saucromyia* and *Sophira* respectively. *Seraca longiplaga* (Hering) is placed as a new synonym of *S. signifera* Walker. *Sophira insueta* Hering is placed as a new synonym of *S. limbipennis* (van der Wulp) and *Sophira borneensis* Hering, stat. n. is raised to species from a subspecies of *S. limbata* Enderlein.

Introduction

Indo-Australian fruit flies show a great diversity of larval hosts. While many breed in fruits or flowers and some beneath the bark of trees, many others develop in the shoots or stems of bamboo (Poaceae: Bambusoideae). Young, developing bamboo shoots are used by most genera in the dacine tribe Gastrozonini (Hancock and Drew 1999), while several genera in the *Acanthonevra* group of the phytalmiine tribe Acanthonevrini (*sensu* Korneyev 1999) are also known to utilise this host (Hancock and Drew 1995a, b). In the *Acanthonevra* complex of genera within this group, larvae of *Rioxoptilona* Hendel use decaying bamboo shoots while those of *Ptilona* van der Wulp develop in the internodes of dead bamboo culms (Hancock 2011b). Larvae in the related *Sophira* complex, however, appear to use living bamboo, developing in the internodes of older shoots or stems.

Hardy (1980) included the following genera within his *Sophira* group: *Sophira* Walker, *Exallosophira* Hardy, *Tritaeniopteron* de Meijere, *Dacopsis* Hering and *Xenosophira* Hardy. Korneyev (1999) referred *Xenosophira* to Tribe Phascini and recognised an expanded *Sophira* complex, placing it in his *Ptilona* subgroup of the *Acanthonevra* group and including the following genera: *Sophira*, *Soosina* Hering, *Kambangania* de Meijere, *Loriomyia* Kertész, *Felderimyia* Hendel, *Antisophira* Hardy, *Exallosophira*, *Langatia* Hancock & Drew, *Cleitamiphanes* Hering and possibly *Colobostroter* Enderlein, *Terastiomyia* Bigot and *Pseudosophira* Malloch.

Hancock and Drew (2003) excluded *Dacopsis* from the *Sophira* complex and included *Loriomyia* (= *Agnostophana* Hering) and *Stymbara* Walker from New Guinea, *Exallosophira* from Solomon Islands and *Enicopterina* Malloch from Fiji. Two further genera, *Adramoides* Hardy from Thailand and *Robertsomyia* Hardy from Papua New Guinea, were added by Hancock and Drew (2005) and Hancock (2005) respectively. *Stymbara* was subsequently transferred to the *Acanthonevra* subgroup by Hancock (2005).

Homoiothemara Hardy, *Phorelliosoma* Hendel, *Polyara* Walker, *Polyaroidea* Hardy and *Pseudacrotoxa* Hering are here added to the *Sophira* complex, while *Parasophira* Hardy is raised from subgeneric level and *Colobostrella* Hendel (= *Saucromyia* Hardy), *Proptilona* Zia and *Seraca* Walker are reinstated from synonymy.

This is a group of often large-sized flies (wing and body lengths 5-16 mm), with the antennal arista normally long-plumose (pubescent in *Phorelliosoma*) and with 2 or 3 pairs of scutellar setae, the middle (secondary) pair distinct, vestigial or absent. The stigma and/or wing cell c are often elongate and the scutum, while often with 2 or 4 dark longitudinal vittae, usually lacks a dark medial vitta. Presutural setae are often absent. The complex is restricted to the Oriental and Indo-Australian Regions, being well represented in Sundaland (Peninsular Malaysia, Sumatra, Java and Borneo), where nine genera and 22 species are recorded. Four endemic genera occur in Sulawesi, two in the southern Philippines, five in New Guinea and one each in the Solomon Islands and Fiji.

In order to aid identification of the 25 genera and 63 species now included in the *Sophira* complex, an annotated key is provided below, updating the partial keys of Hardy (1973, 1974, 1980, 1986a, b, 1988) and Wang (1998), where illustrations of most species may be found. Generic limits generally follow Norrbom *et al.* (1999) except where noted otherwise. Additional sources for illustrations are indicated in the key.

An unrelated species, *Euphranta chrysopila* Hendel (Trypetinae: Adramini), has been collected on bamboo stems in Taiwan and might be mistaken for a member of the *Sophira* complex. It is easily recognised by the presence of long hairs on the anatergite and the wing pattern (largely yellow anteriorly and hyaline posteriorly with a broad black apex and two transverse black bands: see Hendel 1913). Similarly, the slender, black-bodied *Euphranta macularis* (Wiedemann) (= *striatella* van der Wulp) has been collected on *Dendrocalamus brandisii* trunks in southern Thailand (Permkam 2005). It is likely that both species were visiting bamboo to feed on algal or fungal growths rather than to use it as a larval host.

Biology of *Sophira*-complex flies

Little is known of the biology of these flies. *Sophira borneensis* Hering (as *S. limbata* Enderlein) was collected on the bark of felled trees in Sarawak

(Perkins 1938), while Hardy (1980, 1986b, 1988) collected *Cleitamiphanes heinrichi* Hering, *Colobostrella spectabilis* (Hardy), *Seraca linduensis* (Hardy), *Terastiomyia distorta* (Walker) and *T. lobifera* Bigot on foliage of groundcover plants in dense rainforest in Sulawesi. *Tritaeniopteron tetraspilotum* Hardy was collected at cut shoots of the bamboo *Thyrostachys oliveri* in southern Thailand (Permkam 1995). *Felderimyia flavipennis* Hancock & Drew, *F. fuscipennis* Hendel, *F. gombakensis* Hancock & Drew, *Langatia setinerva* Hancock & Drew and *Kambangania ypsilon* (Rondani) were collected at cut bamboo shoots in Malaysia (Hancock and Drew 1994, 1995b, D. Kovac and P. Dohm pers. comm.). *Felderimyia gombakensis* was collected on various species of *Bambusa*, *Dendrocalamus*, *Gigantochloa* and *Cephalostachyum* in Thailand or Malaysia (Dohm *et al.* 2008), while *F. fuscipennis* was collected on stems of *Dendrocalamus membranaceus* and *D. strictus* in southern Thailand (Permkam 2005). A detailed account of the biology of *Felderimyia* species, particularly *F. gombakensis*, may be found in Dohm *et al.* (2008).

The only confirmed breeding records for *Sophira* complex species are from the stems or internodes of living bamboo. *Felderimyia gombakensis* was reared from the internodal spaces of shoots of the bamboos *Gigantochloa scortechinii* and *G. latifolia* in West Malaysia and *Cephalostachyum pergracile* in northern Thailand, the larvae entering the internodes of older bamboo shoots through holes made by larvae of *Lasiochila* Weise beetles (Chrysomelidae: Hispinae), living semi-aquatically in the water body of the internodal cavity and feeding on detritus or microbial growth (Dohm *et al.* 2008). *Langatia setinerva* was bred once from the water-filled internodes of a fallen, rotting shoot of *Gigantochloa scortechinii* (Dohm *et al.* 2008, 2010) that was presumably still alive when infested. *Robertsomyia paradoxa* Hardy was reared from the stems of live *Bambusa* sp. in *Castanopsis* (oak) forest (Hardy 1983), *Polyara bambusae* Hardy from 'young shoots of living *Bambusa*; the larvae tunnel within the stems of young shoots causing the death of the newly opened leaves' (H. Roberts, cited in Hardy 1986) and *Pseudacrotoxa appendicigera* Hering from the shoots of native *Bambusa* by Hardy (1988), all in Papua New Guinea.

Revised and reinstated genera

***Colobostrella* Hendel, 1914, stat. rev.**

(= *Saucromyia* Hardy, 1986, **syn. n.**)

Placed as a synonym of *Sophira* by Hardy (1980) but apparently closer to *Seraca* and reinstated here to include four species from Sulawesi. The wing and scutal patterns differ significantly from those of *Sophira* and related genera; the hyaline indentation from costa enclosing R-M crossvein is an unusual character shared with *Cleitamiphanes*, *Homoiothemara* and *Seraca*. I am unable to find any characters significant enough to separate *Saucromyia* from *Colobostrella* and regard them as synonyms; *C. spectabilis* forms a link

between them and the presence or absence of a transverse hyaline indentation in cell m is seen also in *Kambangania*.

Species: *bicolor* (Hardy), **comb. n.** [ex *Saucromyia*]; *bistriga* (Walker), [ex *Sophira*]; *plagifera* (Walker), (= *ruficauda* Hendel) [type species] [ex *Sophira*]; *spectabilis* (Hardy), **comb. n.** [ex *Sophira*].

Kambangania de Meijere, 1914

Formerly included as a subgenus of *Sophira* and reinstated as a genus by Korneyev (1999); here modified to include three Sundaland species that lack both katepisternal and presutural acrostichal setae and have distinctive wing and scutal markings and a concave face; in two species (*K. metatarsata* and *K. ypsilon*) the mid basitarsus is modified in males.

Species: *metatarsata* de Meijere [type species] (Fig. 1); *simillima* (Hering); *ypsilon* (Rondani) (= *disjuncta* Hardy).

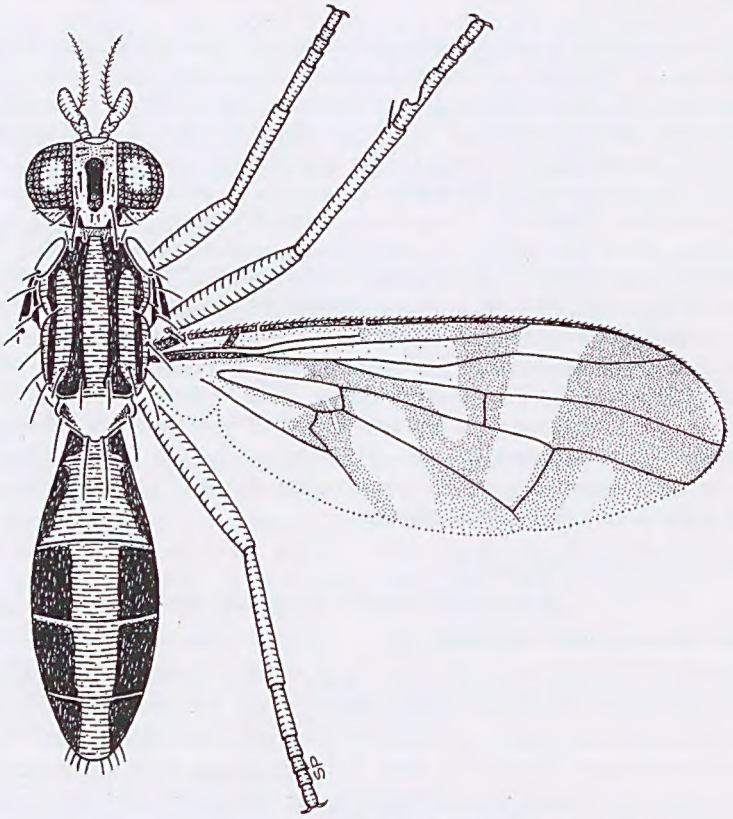

Fig. 1. *Kambangania metatarsata* de Meijere: male from Java.

Parasophira Hardy, 1980, stat. rev.

Established as a subgenus of *Sophira* by Hardy (1980) and here treated as a genus to include a single species from Borneo that cannot confidently be referred to any other recognised genus. It appears closest to *Kambangania* and has a similarly concave face but both katepisternal and presutural acrostichal setae are present and the wing, scutal and abdominal markings are distinctive. *Colobostrella*, *Seraca*, *Soosina* and *Sophira* have the katepisternal setae absent or vestigial, the presutural setae present and a vertical face.

Species: *concinna* (Walker) [type species] (Fig. 2).

Colobostrella biangulata de Meijere, described from Sumatra (de Meijere 1924) and placed in *Sophira* (*Parasophira*) by Hardy (1980), was transferred to *Paraphasca* Hardy (Tribe Phascini) by Hancock (2011a). '*Sophira* (*Parasophira*) sp. related to *concinna*' of Hardy (1988) is a misidentification of *Rioxoptilona shinonagai* (Hardy) in the *Acanthonevra* complex of genera.

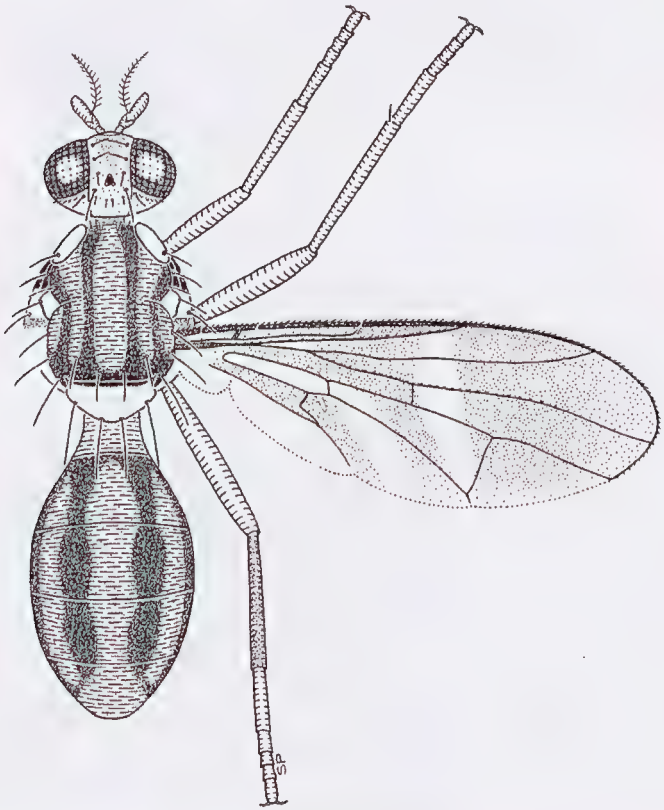

Fig. 2. *Parasophira concinna* (Walker): male from Sarawak.

Phorelliosoma Hendel, 1914

(= *Staurellina* Hering, 1941; = *Mimosophira* Hardy, 1973; = *Orienticaelum* Ito, 1984).

The limits and synonymy of this genus were discussed by Hancock (2011b), who included six species from East and Southeast Asia.

Species: *ambitiosum* Hering; *femoratum* (Shiraki); *hexachaeta* Hendel (= *Mimosophira rubra* Hardy) [type species]; *hilaratum* Hering; *parvisetalis* (Hering); *trypetopsis* (Hering).

Proptilona Zia, 1965, stat. rev.

(= *Heterosophira* Hardy, 1973, **syn. n.**; = *Spaniothrix* Hardy, 1973, **syn. n.**).

Removed from synonymy with *Kambangania* and reinstated as a distinct genus (with two new synonyms, both also removed from *Kambangania*) to include four species from Southeast Asia. *Proptilona* differs from *Kambangania* and related genera in characters noted in the key.

Species: *decora* (Hardy), **comb. n.** [ex *Kambangania*]; *uncinata* (Hering), **comb. n.** [ex *Acanthonevra* Macquart: see Hancock 2011b]; *vittata* (Hardy), **comb. n.** [ex *Kambangania*]; *yunnana* Zia [type species].

Seraca Walker, 1860, stat. rev.

(= *Heringomyia* Hardy, 1986; = *Emheringia* Hardy, 1989).

Placed as a synonym of *Sophira* by Hardy (1980) but informally recognised as a distinct genus by Hancock and Drew (2003). As noted in the key, the wing pattern differs significantly from anything seen in *Sophira* or related genera. Three species from Sulawesi and Ambon are included; other Sulawesian species are referred to *Colobostrella*. For generic synonymy see Hancock and Drew (2003).

Species: *kurahashii* (Hardy), **comb. n.** [ex *Sophira*]; *linduensis* (Hardy), **comb. n.** [ex *Sophira*]; *signifera* Walker (= *Colobostrella heinrichi* Hering; = *Acanthoneura longiplaga* Hering, **syn. n.**) [type species].

I am unable to find any characters separating *Seraca* (= *Emheringia*, a replacement name for *Heringomyia*) *longiplaga* (Hering) from Ambon and *Seraca signifera* Walker from Sulawesi and consider them synonymous. Weak secondary scutellar setae are also known in *S. kurahashii* (see Hardy 1980) and their relative development appears to be an infraspecific character.

Soosina Hering, 1941

Formerly included as a subgenus of *Sophira* and reinstated as a genus by Korneyev (1999). The wing pattern of the two included species from Java and West Malaysia is distinctive; other characters are noted in the key.

Species: *extranea* (de Meijere) [type species]; *malaysiae* (Hancock & Drew) (Fig. 3).

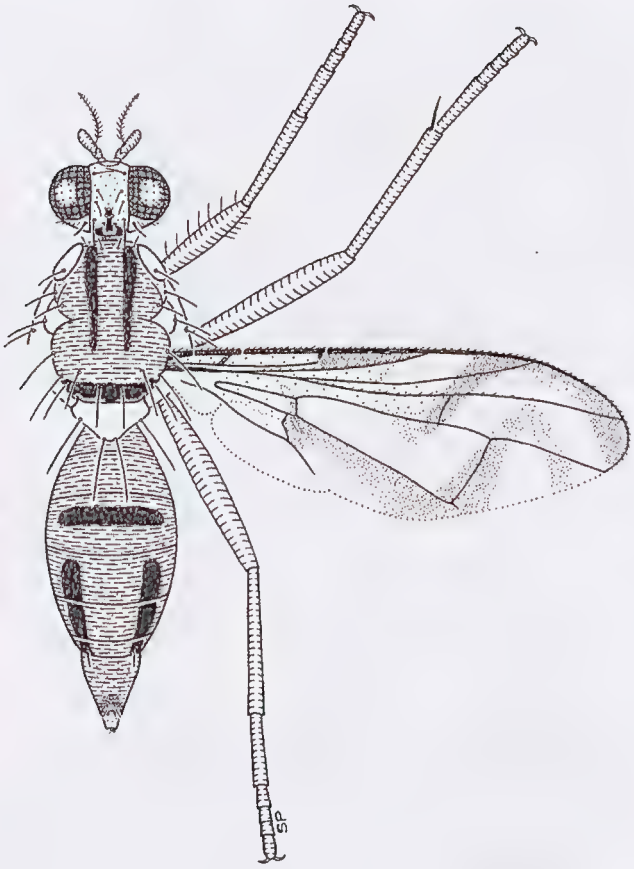

Fig. 3. *Soosina malaysiae* (Hancock & Drew): holotype female from West Malaysia.

Sophira Walker, 1856

(= *Icteroptera* van der Wulp, 1899).

Here modified to include 11 species from Sundaland, Mindanao and NE India; others have been referred to different genera.

Species: *appendiculata* Enderlein; *borneensis* Hering, **stat. n.** [raised from subsp. of *limbata*]; *cameronia* Hancock & Drew; *flavicans* (Edwards); *flavomaculata* (de Meijere); *limbata* Enderlein; *limbipennis* (van der Wulp) (= *insueta* Hering, **syn. n.**); *maculata* (van der Wulp); *philippinensis* Hardy; *phlox* Munro; *venusta* Walker [type species] (Fig. 4).

Specimens of *S. limbata* recorded from Sarawak (Perkins 1938) were referred to *S. l. borneensis* by Hardy (1980) but true *S. limbata* was recorded from

Brunei by Chua (2000), suggesting that one variable or two sympatric species are involved. Pending further evidence the latter arrangement is adopted here, particularly since no intermediates have been recorded and infraspecific variation within the genus appears slight. Males of *S. borneensis* have the genae produced and apically 'feathered' (Hardy 1988), a condition not seen in males of *S. philippinensis*; the condition is uncertain for *S. limbata* and *S. limbipennis* since only females of these species are known.

Based on a comparison of their original descriptions and illustrations (van der Wulp 1899 [type lost], Hering 1952), *Sophira insueta* is placed as a new synonym of *Icteroptera limbipennis*. The apical parts of veins R_{4+5} and M appear to be inaccurately portrayed in van der Wulp's figure but other aspects, particularly the broad costal band narrowly overlapping vein R_{2+3}, render them inseparable; both were described from western Java.

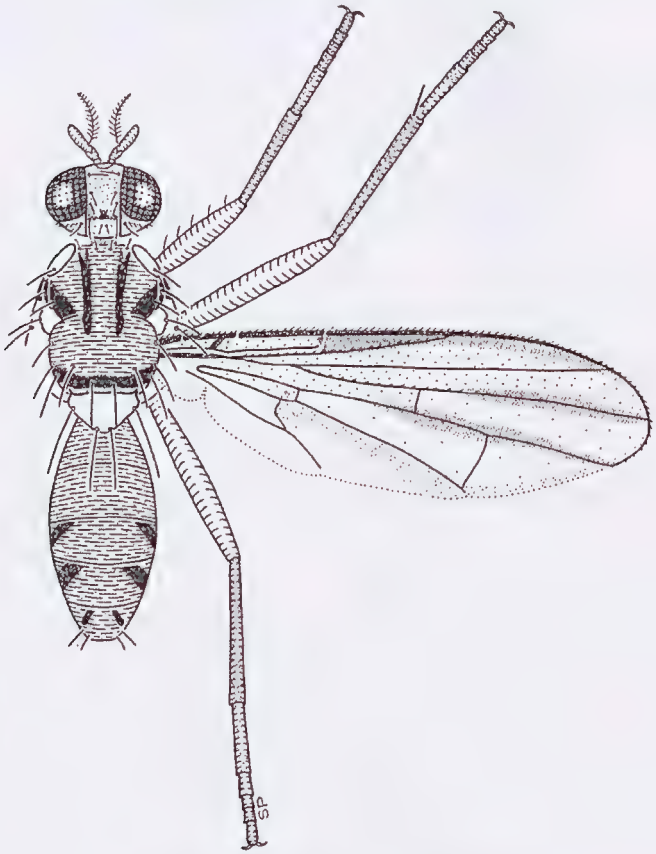

Fig. 4. *Sophira venusta* Walker: male from West Malaysia.

Key to genera and species

1 Wing with R-M crossvein placed well beyond middle of cell dm and closer than its own length to DM-Cu crossvein; vein M distinctly curved posteriorly along margin of cell br so that cell dm is hatchet-shaped, much broader apically than basally and medially 2

– Not as above; wing cell dm of normal shape, gradually broadening towards apex and not distinctly hatchet-shaped 4

2 Wing pattern black with large hyaline spots in cells r_1, br, r_{4+5} and dm and indentations along wing margin in cells m and cu_1; vein R_{2+3} sharply curved anteriorly in apical portion to fuse with vein R_1 and costa; apical portions of veins R_{4+5} and M strongly convergent; scutum with 3 narrow black longitudinal vittae [eastern Indonesia (West Papua) and Papua New Guinea; *Agnostophana veterrima* Hering, 1953 is a synonym] .... *Loriomyia guttipennis* Kertész, 1899

– Wing pattern not as above, yellow basally and with a large brown patch or transverse band in outer half; scutum without a dark medial vitta 3

3 Wing with a large, rounded dark patch in outer half; R-M crossvein almost horizontal, on the same line as the apical portion of vein M and running parallel with apical portion of vein R_{4+5}; scutum yellow except for a tiny black spot behind each wing base; secondary scutellar setae vestigial [Solomon Islands] ..... *Exallosophira elegans* Hardy, 1980

– Wing with a dark transverse band across R-M and DM-Cu crossveins, separated from dark apical area by a hyaline band across wing; scutum yellow with 2 longitudinal black vittae; secondary scutellar setae well developed [Fiji; illustrated by Malloch 1939b] .... *Enicopterina bivittata* Malloch, 1939

4 Wing veins R_{2+3} with 1 or 2 posteriorly-directed spurs or crossveins; vein M with last portion curved anteriorly towards vein R_{4+5}; vein R_{2+3} distinctly angled anteriorly in apical portion 5

– Wing veins R_{2+3} without posteriorly-directed spurs or crossveins; if vein M with last portion curved anteriorly then either stigma much longer than cell c or vein M setose above and below 12

5 Two strong spurs from vein R_{2+3} almost crossing cell r_{2+3} plus one directed towards or connecting with apex of stigma; apical portions of veins R_{4+5} and M strongly convergent; R-M crossvein no more than its own length from DM-Cu crossvein 6

– One strong spur from vein R_{2+3} and with or without a spur towards stigma; apical portions of veins R_{4+5} and M running more or less parallel; R-M crossvein distinctly more than its own length from DM-Cu crossvein; secondary scutellar setae vestigial or absent 11

6 Secondary scutellar setae normally distinct; intrapostalar setae present ... . *Polyara* Walker ... 7

– Secondary scutellar setae vestigial or absent; intrapostalar setae absent … ..... *Polyaroidea* Hardy 9

7 Wing apex mostly hyaline, mottled with brown; face black between antennae [Papua New Guinea] ..... *Polyara bambusae* Hardy, 1986

– Wing apex broadly brown; face entirely yellow 8

8 Wing with a distinct transverse brown band across R-M and DM-Cu crossveins; intrapostalar and secondary scutellar setae weak and hair-like [Papua New Guinea] ..... *Polyara leptotrichosa* Hardy, 1986

– Wing without a distinct transverse brown band across R-M and DM-Cu crossveins from apex of cell r_1; intrapostalar and secondary scutellar setae well developed [eastern Indonesia (Aru, Misool, West Papua) and Papua New Guinea] ..... *Polyara insolita* Walker, 1859

9 Thorax and abdomen largely shiny black; wing with R-M crossvein on line of DM-Cu crossvein and a narrow transverse band from apex of cell bm to wing margin at apex of vein A_1+Cu_2 [Papua New Guinea] .... *Polyaroidea opposita* Hardy, 1988

– Thorax and abdomen yellow to reddish-brown; wing with R-M crossvein slightly before line of DM-Cu crossvein and without a narrow transverse band from apex of cell bm to wing margin 10

10 Ocellar setae weak; 2 pairs of orbital setae; prescutellar acrostichal setae present; wing cells R_1 and R_{2+3} between spurs with a hyaline indentation [Papua New Guinea] ..... *Polyaroidea distincta* Hardy, 1988

– Ocellar setae well developed; 1 pair of orbital setae; prescutellar setae absent; wing cells R_1 and R_{2+3} between spurs without a hyaline indentation [Papua New Guinea] ..... *Polyaroidea univittata* Hardy, 1988

11 Wing cell c about as long as stigma and both cells brown; wing with broad, brown transverse bands basally and medially and apex broadly brown; frontal, orbital and ocellar setae well developed; thorax and abdomen not densely haired; intrapostalar setae present [Papua New Guinea] ..... *Pseudacrotoxa appendicigera* Hering, 1941

– Wing cell c distinctly longer than stigma and both cells yellow; wing with narrow, brown transverse bands crossing R-M and DM-Cu crossveins and apex narrowly brown; frontal, orbital and ocellar setae weak; thorax and abdomen densely yellow-haired; intrapostalar setae absent [Sumatra, West Malaysia, Sarawak and Sabah; a record from the Philippines with no locality data (Malloch 1939a) has not been traced and requires confirmation] ..... *Colobostroter pulchralis* Enderlein, 1911

12 Stigma elongate, longer than cell c and separated from apex of vein R_{2+3} by much less than its own length; vein M strongly curved anteriorly in apical portion towards apex of vein R_{4+5}; secondary scutellar setae vestigial or absent; frontal setae absent [*Neosophira* Hendel, 1914 is a synonym; genus revised by Hardy 1958a] ..... *Terastiomyia* Bigot … 13

– Not as above; if vein M strongly curved anteriorly in apical portion towards apex of vein R_{4+5} then vein M setose and stigma not longer than cell c and separated from apex of vein R_{2+3} by much more than its own length 15

13 Face yellow; abdomen black with a longitudinal, yellow medial vitta; wing cell R_{4+5} without hyaline markings beyond line of DM-Cu crossvein [Sula I. east of Sulawesi] ..... *Terastiomyia clavigera* (Hardy, 1958)

– Face with a large black medial spot; abdomen not as above; wing cell R_{4+5} with a hyaline streak beyond line of DM-Cu crossvein 14

14 Wing with stigma very elongate, ending at or beyond level of DM-Cu crossvein; costa at apex of cell r_1 much shorter than in cell r_{2+3}; apical half of wing with longitudinal hyaline streaks; scutum entirely rufous; genae not produced in males [Sulawesi; *Enicoptera pictipennis* Walker, 1860 is a synonym] ..... *Terastiomyia distorta* (Walker, 1857)

– Wing with stigma ending well before level of DM-Cu crossvein; costa at apex of cell r_1 about equal to that in cell r_{2+3}; apical half of wing with a C-shaped hyaline band from apex of vein M to apical part of cell dm; scutum with a large black spot behind each postpronotal lobe; genae produced into lobes in males [Sulawesi and Ambon; *Enicoptera arcuosa* Walker, 1860 and *Neosophira ferruginea* Hendel, 1914 are synonyms] ..... *Terastiomyia lobifera* Bigot, 1859

15 Wing cell bcu elongate with the apex blunt or weakly acute but not produced into a distinct lobe; stigma shorter than cell c; wing pattern reduced to dark patches largely beyond line of R-M crossvein; secondary scutellar setae vestigial or absent; presutural setae absent 16

– Wing cell bcu with the apex produced into a distinct lobe; stigma often as long as or longer than cell c; wing pattern variable, often extensive basally; presutural setae present or absent 18

16 Head with 2 pairs of distinct frontal setae; scutum with 4 black longitudinal vittae, the lateral pair restricted to the postsutural region; wing cells bc, c and stigma not conspicuously slender and stigma less than half length of cell c; middle femora with 2 rows of stout ventral spines [southern (peninsular) Thailand] ... *Adramoides picta* Hardy, 1973

– Head without distinct frontal setae; scutum without longitudinal vittae; wing cells bc, c and stigma conspicuously slender and stigma more than half length of cell c; middle femora without rows of stout ventral spines; postpronotal setae absent 17

17 All head and body setae absent; scutellum with a pair of distinct subapical tubercles; wing pattern reduced to a small, apical dark patch; R-M crossvein placed well beyond middle of cell dm, about its own length from DM-Cu crossvein [Papua New Guinea; illustrated by Hardy 1983] ..... *Robertsomyia paradoxa* Hardy, 1983

– Head and body setae not all absent; scutellum without subapical tubercles; wing with a dark transverse band from costa in cell r_1 to vein M above apical part of cell dm and a large subapical dark patch with a large, round hyaline indentation in cell m; R-M crossvein placed near middle of cell dm [Philippines (Mindanao)] ..... *Pseudosophira bakeri* Malloch, 1939

18 Vein M setose above and below; 1 pair of distinct orbital setae near middle of frons, the upper pair absent 19

– Vein M not setose; normally 2 pairs of orbital setae, the upper pair usually weak and hair-like, rarely absent 22

19 Vein M not strongly curved anteriorly in apical portion towards apex of vein R_{4+5}; anterior notopleural seta enclosed in a black lateral patch; wing with broad transverse brown bands from costa at end of cell c to behind base of vein R_{4+5} and from apical half of stigma across RM crossvein to middle of cell dm, plus a broad apical area from line of DM-Cu crossvein enclosing a hyaline patch across vein M in cells r_{4+5} and m [Thailand, West Malaysia (Fig. 5)] ..... *Langatia setinerva* Hancock & Drew, 1995

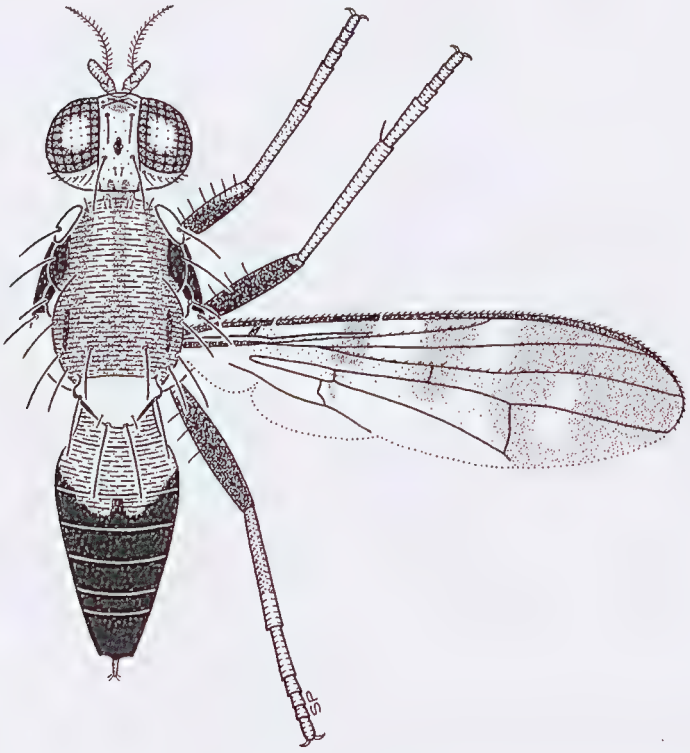

Fig. 5. *Langatia setinerva* Hancock & Drew: holotype female from West Malaysia.

– Vein M strongly curved anteriorly in apical portion towards apex of vein R_{4+5}; anterior notopleural seta enclosed within a pale patch or band; wing characters not as above ..... *Felderimyia* Hendel ... 20

20 Wing dark brown except for a narrow hyaline posterior margin; scutum with a white, elongate medial vitta extending onto scutellum; abdomen entirely black [India, Burma, Thailand, Laos, S China (Guangxi: Wang and Chen 2002), West Malaysia; illustrated by Hancock and Drew 1994 and Dohm *et al.* 2008] ..... *Felderimyia fuscipennis* Hendel, 1914

– Wing pattern largely yellow to yellow-brown in basal and medial portions; scutum without a white medial vitta; abdomen with at least terga 2 and 3 partly pale 21

21 Scutum entirely pale; wing with cell br mostly hyaline and an oval hyaline spot at base of cell r_{4+5} between R-M and DM-Cu crossveins; abdominal terga 1-2 with black sublateral bands, 3 entirely pale and 4-5 black [Laos, West Malaysia; illustrated by Dohm *et al.* 2008 (Fig. 6)] .... *Felderimyia flavipennis* Hancock & Drew, 1994

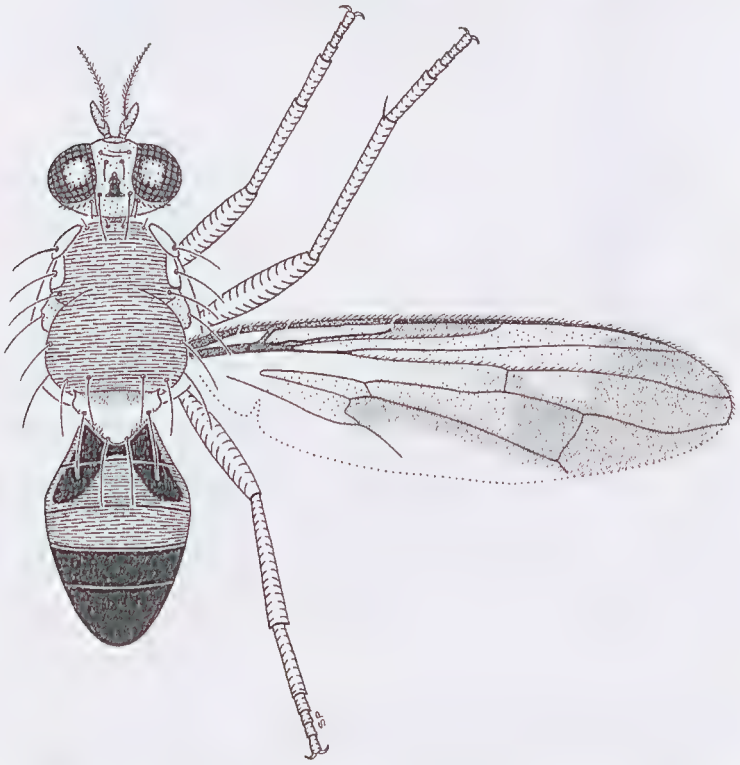

Fig. 6. *Felderimyia flavipennis* Hancock & Drew: holotype male from West Malaysia.

– Scutum with black lateral presutural patches and broad, dark dorsolateral postsutural vittae; wing with cells br and base of r_{4+5} pale brown; abdomen black except pale medially on terga 2-5 [S China (Yunnan: Dohm *et al.* 2008), Thailand, West Malaysia; illustrated by Dohm *et al.* 2008 (Fig. 7)] ..... *Felderimyia gombakensis* Hancock & Drew, 1995

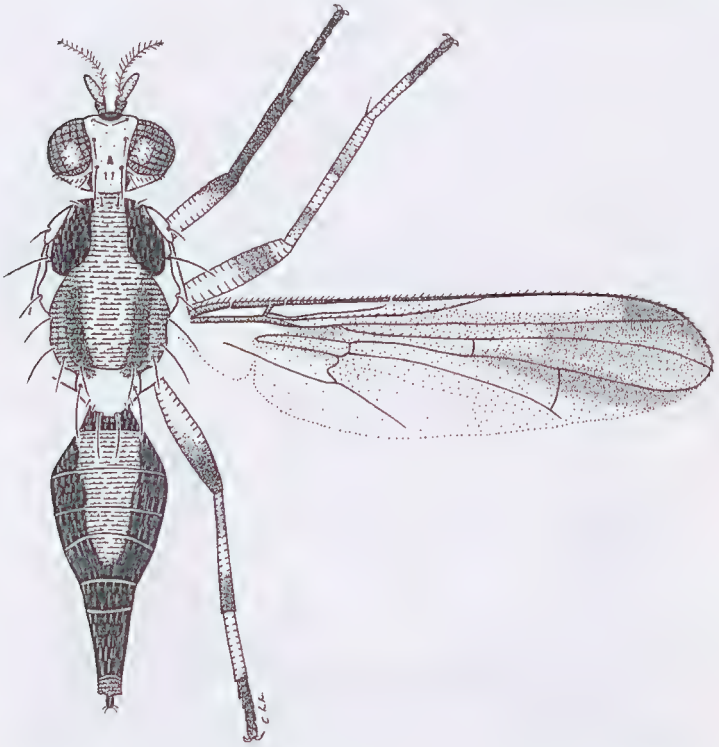

Fig. 7. *Felderimyia gombakensis* Hancock & Drew: holotype female from Malaysia.

22 Wing pattern banded, with a dark transverse band from behind apex of vein Sc to cell bcu and two dark, oblique bands across R-M and DM-Cu crossveins from costa; stigma short, about half length of cell c; head with 2 pairs each of distinct frontal and orbital setae, the upper orbitals short; scutum normally with dark, lateral postsutural vittae but without a complete submedian pair; presutural setae present; secondary scutellar setae well developed ..... *Tritaeniopteron* de Meijere ... 23

– Wing pattern often reduced but not with a transverse basal and two oblique discal bands; stigma often as long as or longer than cell c; head normally with 1 or 2 pairs each of frontal and orbital setae, the upper orbitals often reduced; scutum often with dark submedian vittae 27

23 Scutum yellow with a black lateral presutural spot and lateral postsutural streak; abdominal terga 3-5 each with a pair of black spots; face entirely yellow [Taiwan; illustrated by Hardy 1958b] .... *Tritaeniopteron excellens* (Hendel, 1915)

– Scutum with the black postsutural vittae broad and either L- or C-shaped; face black or yellow 24

24 Scutum with dark lateral vittae straight-sided or almost L-shaped 25

– Scutum with dark vittae C-shaped, curving inwards at either end 26

25 Face with a large black medial spot; scutum with a pale brown spot on the inner side of each lateral vitta; abdomen with black basolateral patches on terga 3-5 (in female) or 4-5 (in male); [Sri Lanka; illustrated by Senior-White 1922] ..... *Tritaeniopteron punctatipleurum* (Senior-White, 1922)

– Face entirely yellow; scutum with a pair of black submedial vittae extending posteriorly to level of supraalar setae; abdomen with black transverse basal bands across terga 3-5 and lateral margins of terga 2-4 broadly black; scutum with dark lateral vittae connected along posterior margin [Philippines (Luzon)] ..... *Tritaeniopteron flavifacies* Hardy, 1974

26 Face with a large black medial spot; abdomen with transverse black basal bands on terga 3-5 [Indonesia (Java); illustrated by Hardy 1958b] .... *Tritaeniopteron eberneum* de Meijere, 1914

– Face entirely yellow; abdominal terga 3-5 with black basolateral marks extending basally towards mid-line and often separated into an additional pair of submedian spots [northern, central and southern Thailand; black markings on scutum and abdomen a little variable in extent; illustrated by Hancock and Drew 1994, who placed *T. elachispilotum* Hardy, 1973 as a synonym] ..... *Tritaeniopteron tetraspilotum* Hardy, 1973

27 Wing with stigma normally about half to two-thirds length of cell c; cell c entirely hyaline; cell r_{4+5} with a hyaline spot or indentation with its midline just beyond line of DM-Cu crossvein or pattern reduced and cell r_{4+5} entirely hyaline above DM-Cu crossvein; cell cu_1 largely hyaline, at least basally and medially; presutural setae usually absent; secondary scutellar setae often distinct 28

– Wing usually with stigma almost as long as to longer than length of cell c; if distinctly shorter then with a hyaline indentation from costa at apex of stigma that encloses R-M crossvein; cell c often at least partly coloured; cell r_{4+5} usually without a hyaline spot or indentation just beyond line of DM-Cu crossvein; head normally with 1 pair of distinct frontal setae, sometimes with a weak second pair anteriorly; presutural setae usually present; secondary scutellar setae normally very weak or absent 37

28 Arista pubescent; 2 pairs of distinct frontal setae; 2 pairs of orbital setae situated on upper part of head, the upper orbital seta often weak; wing distinctly narrow, with cell cu_1 almost entirely hyaline and pattern often

reduced to isolated patches; secondary scutellar setae distinct, a third to a half length of apicals ..... *Phorelliosoma* Hendel ... 29

– Arista plumose; 1 pair of distinct frontal setae and sometimes a weak anterior pair; 1 pair of distinct lower orbital setae situated near middle of frons, the upper pair of orbital setae usually weak or absent; wing not distinctly narrow and cell cu_1 not almost entirely hyaline; scutum with 4 dark longitudinal vittae, usually united posteriorly; apex of cell r_{2+3} often subhyaline, basal and apical dark patches separated by a broad hyaline indentation from costa in cell r_1 to vein Cu_1 at apex of cell dm and the large hyaline spot in cell r_{4+5} adjacent to line of DM-Cu crossvein united or almost united with a broad hyaline indentation in cell m; secondary scutellar setae very weak or absent ..... *Proptilona* Zia ... 34

29 Scutum with 4 dark longitudinal vittae; wing pattern extensive, extending broadly into anterior half of cell dm; cell r_1 with a broad, triangular hyaline indentation beyond apex of stigma 30

– Scutum with no or 2 dark longitudinal vittae; wing pattern reduced to isolated patches medially, apically and along DM-Cu crossvein; cell r_1 with a broad, rectangular hyaline indentation extending across wing ... 31

30 Prescutellar acrostichal setae present [China (Hubei, Fujian, Sichuan, Guangxi)] ..... *Phorelliosoma parvisetalis* (Hering, 1939)

– Prescutellar acrostichal setae absent [Japan (Honshu, Shikoku)] .... *Phorelliosoma femoratum* (Shiraki, 1933)

31 Wing with medial dark patch behind stigma extending broadly to vein M in apical half of cell br and enclosing a hyaline spot posteriorly 32

– Wing with medial dark patch behind stigma reduced to separated spots in cell r_1 and across R-M crossvein and not enclosing a hyaline spot in cell br 33

32 Scutellum normally with a pair of dark spots; wing with pattern extending weakly into cell dm behind R-M crossvein and halfway into cell r_{4+5} before DM-Cu crossvein; stigma entirely dark [Taiwan, Vietnam; *Mimosophira rubra* Hardy, 1973 was placed as a synonym by Wang (1998); records from NE Burma and SW China (Wang 1998) belong to *P. hilaratum*] ..... *Phorelliosoma hexachaeta* Hendel, 1914

– Scutellum without a pair of dark spots; wing with pattern extending no more than very faintly into cell dm behind R-M crossvein or into cell r_{4+5} before DM-Cu crossvein; stigma often paler at base [NE Burma and SW China (SE Xizang [Tibet]); illustrated by Wang 1998, as '*P. hexachaeta*'] ..... *Phorelliosoma hilaratum* Hering, 1941

33 Wing with apical dark patch entire from apex of cell r_1 to beyond apex of vein M in cell m, the apical part of cell r_{2+3} dark except for a small hyaline central spot [NE India; illustrated by Hering 1941b] .... *Phorelliosoma ambitiosum* Hering, 1941

– Wing with apical dark patch reduced to isolated patches from apex of cell r_1 and at wing apex, separated by a broad hyaline area in cell r_{2+3} [NE Burma; illustrated by Hering 1941a, as *Staurellina trypetopsis*] .... *Phorelliosoma trypetopsis* (Hering, 1941)

34 Wing with broad hyaline indentation in cell m extending anteriorly across cell r_{4+5} into cell r_{2+3} and curving towards wing apex behind vein R_{2+3}; abdomen largely reddish-yellow, tinged with black on lateral margins [central Burma; illustrated by Hering 1938, as *Pseudacidia uncinata*] .... *Proptilona uncinata* (Hering, 1938)

– Wing with broad hyaline indentation in cell m usually extending across cell r_{4+5} but not crossing vein R_{4+5} into cell r_{2+3} 35

35 Scutum with vittae not connected posteriorly; abdomen reddish-brown, paler medially [S China (Yunnan)] ..... *Proptilona yunnana* Zia, 1965

– Scutum with submedial pair or all 4 vittae connected by a black band along posterior margin 36

36 Wing with hyaline spot in cell r_{4+5} narrowly separated from indentation in cell m along vein M; dorsocentral setae absent; abdomen black with a yellow medial vitta [C & S Thailand] ... *Proptilona decora* (Hardy, 1973)

– Wing with hyaline spot in cell r_{4+5} broadly united with indentation in cell m across vein M; dorsocentral setae present; abdomen largely brownish-red to black [N & C Thailand, Laos] ..... *Proptilona vittata* (Hardy, 1973)

37 Wing with a hyaline indentation from costa at apex of stigma extending to and enclosing R-M crossvein; presutural setae present 38

– Wing with hyaline indentation from costa at apex of stigma absent or not enclosing R-M crossvein but crossing base of cell r_{4+5} into cell dm 46

38 Wing with three broad, posterior hyaline indentations, 1 from apex of cell m across vein M into cell r_{4+5}, 1 in cell m alongside DM-Cu crossvein and 1 obliquely across basal part of cell cu_1 into base of cell dm; stigma short, about half length of cell c; eyes broadly protuberant in both sexes; face concave in profile; scutum with posterior half black and anterior half yellow with a dark transverse band level with anterior notopleural and presutural setae [Sabah] ..... *Homoiothemara eurycephala* Hardy, 1988

– Not as above; wing with a transverse hyaline band in apical half of cell dm that normally curves anteriorly into cell r_{4+5} and sometimes forms a complete or interrupted inverted C- or U-shaped band extending across cell r_{2+3} to apices of cells r_{4+5} or m; stigma distinctly longer than half length of cell c; face vertical in profile or slightly concave near epistomal margin; scutum without a dark transverse band anteriorly 39

39 Wing with stigma distinctly shorter than cell c and with a large rounded dark patch in distal half separated from a narrow dark costal band and united transverse band by a hyaline C-shaped band from middle part of cell dm to apex of cell r_{4+5} and with a parallel hyaline band behind its

apical part to apex of vein M; head broad; scutum without dark submedial vittae [N and C Sulawesi] ..... *Cleitamiphanes heinrichi* Hering, 1941

– Not as above; stigma about as long as cell c; hyaline band from near apex of cell dm towards apex of cell m incomplete, interrupted or inverted U-shaped; scutum black or with 2 black submedial vittae or 4 black spots; scutellum densely short-setose 40

40 Wing with a hyaline basal indentation from cell c to BM-Cu crossvein and another either from within cell cu_1 or from posterior margin to basal part of cell dm; DM-Cu crossvein strongly bowed, the posterior half almost parallel with wing margin; scutum with 2 brown to black longitudinal vittae ..... *Seraca* Walker ... 41

– Basal half of wing without hyaline indentations; DM-Cu crossvein not strongly bowed, the posterior half distinctly divergent from wing margin; scutum black or with 4 black spots, the posterior pair often extended anteriorly as short vittae extending to or beyond supraalar setae; secondary scutellar setae weakly present ..... *Colobostrella* Hendel ... 43

41 Abdominal terga 1-4 yellow medially and black laterally, tergum 5 mostly or entirely black; wing pattern variable, the hyaline band from apical part of cell dm reaching or just crossing vein R_{4+5} anteriorly, or joined with hyaline indentation from cell m by a loop through cell r_{2+3} [Sulawesi and Ambon; *Acanthoneura longiplaga* Hering, 1939 and *Colobostrella heinrichi* Hering, 1942 are synonyms] ..... *Seraca signifera* Walker, 1860

– At least abdominal terga 3-4 with broad transverse dark basal bands ... 42

42 Scutum with 2 black vittae extending over sides of scutellum onto abdomen; abdominal terga 1 and 2 black laterally; wing with hyaline band through cell dm extending to wing margin in posterior corner of cell m [N Sulawesi] ..... *Seraca kurahashii* (Hardy, 1980)

– Scutum with 2 pale brown vittae extending faintly over sides of scutellum; abdominal terga 1 and 2 yellow with tinges of brown laterally; wing with hyaline band through cell dm ending in cell dm at vein Cu_1 [C Sulawesi] ..... *Seraca linduensis* (Hardy, 1980)

43 Wing cell m with an oblique hyaline indentation and cell r_{4+5} with a hyaline band or spots beyond R-M crossvein; band from cell dm extending entirely or intermittently into apical part of wing, scutum black or with 4 black spots, the posterior pair pointed anteriorly 44

– Wing cells m and r_{4+5} beyond R-M crossvein without hyaline indentations and band from cell dm ending as a curved hook in cell r_{2+3}; scutum with 4 black spots, the posterior pair extended anteriorly as short vittae 45

44 Head and face black; scutum black; wing with isolated spots or indentations in apical part of cells r_{2+3} and r_{4+5}; abdomen black [N Sulawesi] ..... *Colobostrella bicolor* (Hardy, 1986)

– Head and face yellow; scutum pale with 4 black spots; wing with the hyaline band continuing through apical part of cells r_{2+3} and r_{4+5} to extreme apex of cell m; abdomen almost entirely pale [C Sulawesi] .... *Colobostrella spectabilis* (Hardy, 1980)

45 Face entirely black; mid and hind femora and fore tibiae and tarsi dark brown to black [S Sulawesi; *Colobostrella ruficauda* Hendel, 1915 is a synonym] ..... *Colobostrella plagifera* (Walker, 1860)

– Face and legs yellow [S Sulawesi] .... *Colobostrella bistriga* (Walker, 1860)

46 Face concave in profile; scutum normally with 4 dark longitudinal vittae, the lateral and submedian pair on each side often connected anteriorly, the lateral vitta sometimes reduced anteriorly or posteriorly; wing pattern largely brown with a broad, transverse hyaline band from apex of stigma and between R-M and DM-Cu crossveins to posterior apex of cell dm; cell cu_1 with a broad, oblique posterior hyaline indentation that crosses vein Cu_1 into base of cell dm; wing margin often broadly diffuse from cell r_1 to cell m; abdomen with at least terga 4-6 yellow medially and either broadly black laterally or with dark submedial bands and lateral margins 47

– Face vertical in profile or slightly concave near epistomal margin; scutum with at most 2 longitudinal vittae and a lateral patch between postpronotal lobe and suture that normally connects with a dark band over anepisternum; wing pattern not as above, if with a broad, transverse hyaline band between RM and DM-Cu crossveins to apex of cell dm then wing pattern largely yellow and abdomen with arcuate basal black bands across terga 2-4; cell cu_1 usually with a dark anterior band along vein Cu_1 behind cell dm that often continues as a dark band over DM-Cu crossvein 50

47 Wing without a pale anterobasal area and with the transverse hyaline band inwardly oblique, beginning behind apex of stigma in cell r_1; scutum with complete lateral vitta separated from submedial vitta anteriorly and joined with black band over anepisternum; presutural setae present; abdominal terga 2-4 yellow medially and sublaterally and with black submedial vittae and lateral margins that weakly unite on tergum 5 [Sarawak, Sabah, Kalimantan (Fig. 2)] ..... *Parasophira concinna* (Walker, 1856)

– Wing with a broad, pale anterobasal area that projects as a narrow extension across cell br near its apex and just into cell dm and with the transverse hyaline band not inwardly oblique, beginning at costa in cell r_1 at extreme apex of stigma; scutal vittae not as above, if with lateral vitta united with black band over anepisternum then it is largely absent beyond suture; presutural setae absent; abdomen not as above, the lateral black areas not separated sublaterally ..... *Kambanganía* de Meijere ... 48

48 Scutum with 2 black vittae, the lateral pair discontinuous or forming a patch united with anepisternal band; abdomen with black arcuate bands across bases of terga 2 and 3 and broadly black laterally on terga 4-6 [Sarawak, Sabah, Kalimantan] ... *Kambangania simillima* (Hering, 1952)

– Scutum with 4 black vittae, the lateral and sublateral pair joined anteriorly and not united with anepisternal band; abdominal terga 3-6 broadly black laterally 49

49 Scutum with submedial vittae connected posteriorly; scutellum entirely yellow; wing cell m without a hyaline indentation; dark discal area broadly diffuse around entire apical margin; mid basitarsus of male with a medial concavity; abdomen with arcuate black bands across bases of terga 2 and 3 and terga 3-6 broadly black laterally and yellow medially [Sumatra, West Malaysia, Sarawak; *Sophira (Kambangania) disjuncta* Hardy, 1980 is a synonym (Fig. 8)] .... *Kambangania ypsilon* (Rondani, 1875)

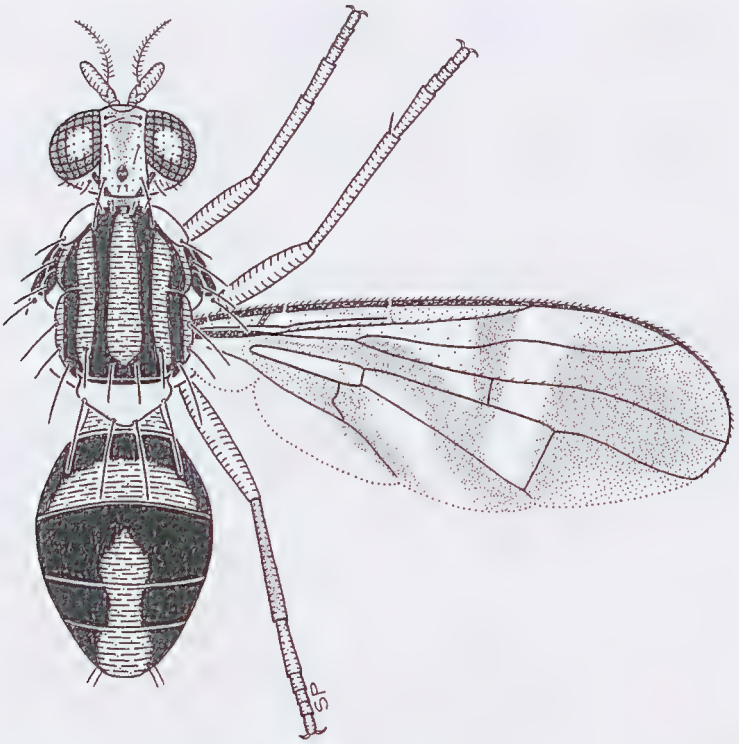

Fig. 8. *Kambangania ypsilon* (Rondani): male from West Malaysia.

– Scutum with submedial vittae not connected posteriorly; scutellum with distinct lateral black streaks; wing with a hyaline indentation in cell m running parallel with DM-Cu crossvein; dark discal area narrowly diffuse at apex of cell r_{2+3}; mid basitarsus of male with a subbasal hook-like process; abdomen black laterally and yellow medially on all terga [Java (Fig. 1)] ..... *Kambangania metatarsata* de Meijere, 1914

50 Wing with a large, oval brown area behind a C-shaped hyaline band which runs from apex of cell r_{4+5} to apex of cell dm and separates it from a narrow, brown C-shaped band, running parallel to the hyaline band, from costa at apex of cell r_1 and over R-M crossvein to vein Cu_1; oval brown area connected along DM-Cu crossvein with a brown longitudinal band in upper part of cell cu_1 along vein Cu_1; scutum with submedial vittae reaching black posterior margin and a black lateral line from behind postpronotal lobe to wing base; presutural and prescutellar setae absent [Philippines (Mindanao)] ..... *Antisophira vittata* Hardy, 1974

– Not as above; wing without a C-shaped hyaline band enclosing a dark oval subapical area; if scutum with a black lateral patch this does not form a line from postpronotal lobe to wing base; presutural and prescutellar setae present 51

51 Wing pattern with two sinuous, yellow to brown bands, one from anteromedial part of cell dm across R-M crossvein to apical part of cell r_1 and along costa to apex of cell r_{4+5}, the other from base of cell cu_1 along posterior margin of vein Cu_1 and across DM-Cu crossvein, forming an inverted U-shaped band in cell r_{4+5} and crossing vein M to wing margin in cell m; R-M crossvein placed within apical third of cell dm and beyond apex of stigma; head with upper pair of orbital setae distinct; scutum with 2 longitudinal black vittae that end well before the black band along posterior margin and no lateral black patch or band between postpronotal lobe and suture; scutellum with only a few fine hairs on disc; abdomen with an isolated pair of black sublateral bands on terga 3-6 or 4-6 .... *Soosina* Hering ... 52

– Wing pattern not as above; R-M crossvein placed nearer middle of cell dm and at or before apex of stigma; head with upper pair of orbital setae normally weak and indistinct; scutum with longitudinal black vittae often complete and usually with a black lateral patch or band behind postpronotal lobe to suture or wing base that is often connected to a black band on anepisternum; scutellum normally densely short-setose on disc; abdomen not as above ..... *Sophira* Walker ... 53

52 Abdomen with a black transverse band on tergum 3 and sublateral bands on terga 4-6 [West Malaysia (Fig. 3)] .... *Soosina malaysiae* (Hancock & Drew, 1995)

– Abdomen with black sublateral bands on terga 3-6 and no transverse band on tergum 3 [Java] ..... *Soosina extranea* (de Meijere, 1914)

53 Scutum with no lateral black patch between postpronotal lobe and suture and submedial vittae short, not reaching dark band or spots along posterior margin; anepisternum entirely yellow; wing pattern mostly yellow with darker patches along costa, wing margin and along vein Cu_1 to near base of cell cu_1; abdomen entirely yellow or with small black spots on terga 4 and 5 54

– Scutum with a lateral black patch behind postpronotal lobe to suture or wing base that is often connected to a black band on anepisternum; submedial vittae normally complete or almost so, if short then wing largely yellowish with indistinct darker bands or spots along veins; abdomen often with broad black arcuate bands basally on terga 2-4, sometimes reduced to narrow bands or spots 55

54 Abdomen with black spots on terga 4 and 5; wing with brown patches largely isolated [Sumatra; illustrated by Hardy 1958b] .... *Sophira flavicans* (Edwards, 1919)

– Abdomen entirely yellow; wing with brown patches continuous from stigma along wing margin and along vein Cu_1 almost to base of cell cu_1, leaving a large pale patch in cell m [NE India (Meghalaya); illustrated by Hardy 1958b and Munro 1935] ..... *Sophira phlox* Munro, 1935

55 Wing largely yellowish in anterior half, with a narrow, indistinct dark band alongside vein Cu_1 to base of cell cu_1, and with either narrow bands along costa and other veins or a dark spot on vein M between R-M and DM-Cu crossveins; scutum with 2 short submedian longitudinal black vittae, a transverse black band along posterior margin and an oblique black band behind each postpronotal lobe to suture that connects with black band over anepisternum 56

– Not as above; wing with distinct dark areas and scutum with the 2 submedial longitudinal black vittae complete or almost complete 57

56 Wing with narrow, indistinct dark bands along costa and veins R_{4+5} and M; abdomen with small, oblique, black lateral patches on terga 3-5 [southern Thailand (Nakhon Si Thammarat), West Malaysia, Singapore, Kalimantan; a record from the Moluccas is regarded as an error (Hancock and Drew 1995b) (Fig. 4)] ..... *Sophira venusta* Walker, 1856

– Wing with an oval brown spot on vein M between (but not reaching) R-M and DM-Cu crossveins [Nias Island near Sumatra; illustrated by van der Wulp 1899] ..... *Sophira maculata* (van der Wulp, 1899)

57 Wing with anterior margin dark brown from apex of vein Sc to or beyond apex of vein R_{2+3} and with a broad, dark longitudinal band through upper part of cell cu_1 along vein Cu_1, across apical part of cell dm and DM-Cu crossvein and along lower part of cell r_{4+5} along vein M to wing apex; abdominal bands on terga 2-4 sometimes conspicuously reduced 58

– Wing pattern not as above, either with distal half largely yellow to pale brown with a small or large irregular brown patch or with a broad, transverse hyaline indentation from apex of stigma to posterior apex of cell dm; abdominal bands on terga 2-4 broad and not reduced 61

58 Wing with dark costal band extending narrowly to or beyond vein M and broad in cell r_1, extending well behind vein R_1 and almost reaching vein R_{2+3} for most of its length; anepisternum with a broad black vertical band [Sumatra, West Malaysia, Brunei; illustrated by Hardy 1958b] .... *Sophira limbata* Enderlein, 1911

– Wing with dark costal band interrupted, not continuous through apex of cell r_{2+3}; if anepisternum with a broad black vertical band then costal band narrow, not extending behind vein R_1 except at apex and not almost reaching vein R_{2+3} for most of its length 59

59 Wing with dark costal band broad, extending behind vein R_{2+3} for much of its length; apex of vein R_{4+5} normally with a brown patch continuous with the brown posterior band from apex of cell r_{4+5}, leaving only a narrow, pale interruption to costal band in upper half of cell r_{2+3}; anepisternum entirely yellow [western Java; *Sophira insueta* Hering, 1952 is regarded as a synonym; illustrated by Hardy 1958b, Hering 1952 and van der Wulp 1899] ..... *Sophira limbipennis* (van der Wulp, 1899)

– Wing with dark costal band narrow, not reaching or extending behind vein R_{2+3}; margin entirely pale from apex of vein R_{2+3} to beyond apex of vein R_{4+5}; anepisternum with a broad black vertical band 60

60 Thorax with posterior half to two-thirds of katepisternum, all of anepimeron and front edge of katatergite and anatergite yellow; abdomen with dark basal bands on terga 2-4 narrow, those on tergum 4 broadly interrupted or very weakly connected medially; male head with genae produced and apically feathered [Sarawak, Sabah, Kalimantan] .... *Sophira borneensis* Hering, 1952

– Thorax with posterior two-thirds of katepisternum black and with this marking continuous over lower anepimeron, katatergite, anatergite and mediotergite; abdomen with complete, arcuate, dark basal bands on terga 2-4; male head with genae not modified [Philippines (Mindanao, Negros)] ..... *Sophira philippinensis* Hardy, 1974

61 Wing markings mostly yellow except stigma brown and pattern tinged brown over vein M, DM-Cu crossvein and along vein Cu_1 in upper part of cell cu_1; with a transverse hyaline band beginning broadly at costa and behind apex of stigma in cell r_1 and running between R-M and DM-Cu crossveins to end at posterior apex of cell dm; scutum with submedial vittae ending just before a broad black posterior margin and a black patch between postpronotal lobe and suture connected to black anepisternal band [Sumatra, Sabah] ..... *Sophira flavomaculata* (de Meijere, 1924)

– Wing pattern not as above, without a transverse hyaline band between R-M and DM-Cu crossveins; scutum with submedial vittae reaching black posterior margin 62*

62 Wings subhyaline to yellowish with an isolated dark brown spot on vein M covering entire area between R-M and DM-Cu crossveins; stigma brown; male with a distinct lobe to cell cu_1 at apex of vein A_1+Cu_2 [Sumatra, Sarawak; illustrated by Hardy 1958b] .... *Sophira appendiculata* Enderlein, 1911

– Wings largely dull brown with diffuse anterior and apical margins, a triangular hyaline patch in apical half of cell br and most of cell dm and hyaline posterior margin filling most of cell cu_1 behind a dark band along vein Cu_1; male without a distinct lobe to cell cu_1 at apex of vein A_1+Cu_2 [West Malaysia (Fig. 9)] ..... *Sophira cameronia* Hancock & Drew, 1995

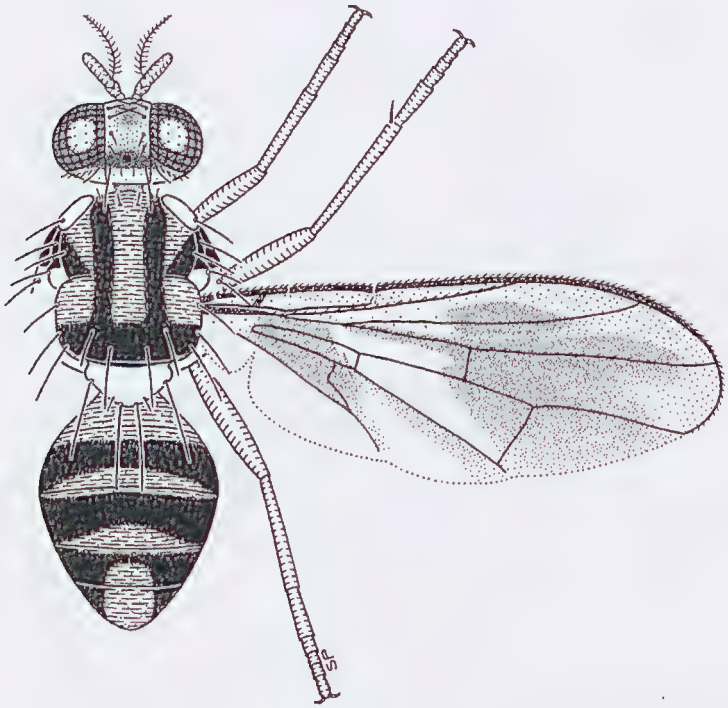

Fig. 9. *Sophira cameronia* Hancock & Drew: holotype male from West Malaysia.

* An undescribed species from Sabah (Hardy 1988: 113) keys here but differs from the remaining species in wing pattern, particularly the narrow brown band running along veins Cu_1 and DM-Cu and looping over the apical portion of vein M to end at the wing margin in the upper part of cell m.

Discussion

The large number of monotypic genera reflects the distinctive nature of many of the species in this complex. It is likely that further study will enable some of these to be synonymised and combined, but at present there is insufficient evidence to establish this. Presutural setae are present in some species (*e.g. Felderimyia flavipennis, Proptilona uncinata*) in genera where they otherwise do not occur and this character is possibly subject to reversal.

The New Guinea genera *Polyara*, *Polyaroidea* and *Pseudacrotoxa* were previously referred to an unplaced group possibly allied to the Phascini (Korneyev 1999, Hancock and Drew 2003), based largely on the vanes of the phallapodeme being fused into a Y-shaped structure; however, this state occurs in a number of different lineages within subfamily Phytalmiinae (including *Rioxa* Walker) (Korneyev 1999) and appears to be homoplasious. The rearing of this group of genera from the stems of living bamboo (Hardy 1986, 1988) supports their association with the *Sophira* complex.

This complex is well developed in Sundaland. Several genera are endemic to this region plus the southern Philippine island of Mindanao and there are small radiations of endemic genera into Sulawesi and the Papuan Region. Apart from records of *Sophira venusta* from southern peninsular Thailand (Hancock and Drew 1995b) and *S. philippinensis* from Negros (Hardy 1974), only a single species of these otherwise endemic genera, *Sophira phlox* from NE India, is known outside Sundaland or Mindanao. Similarly, the only two species recorded from Ambon (*Terastiomyia lobifera* and *Seraca signifera*), in the southern Moluccas, also occur in Sulawesi.

The distribution of *Sophira phlox* is unusual, known only from the Garo Hills of western Meghalaya, just north of Bangladesh (Munro 1935). It appears to be derived from the Sumatran *Sophira flavicans*, suggesting a dispersal route via the Nicobar-Andaman islands and western Burma rather than via Southeast Asia proper, where the genus has not been recorded. The latter route is evident in the only other species known from India, the widespread *Felderimyia fuscipennis* and the endemic *Phorelliosoma ambitiosum* from the Himalayan foothills of West Bengal.

Four genera (*Phorelliosoma*, *Proptilona*, *Tritaeniopteron* and *Adramoides*), united by an elongate wing cell c in association with a relatively short stigma, are exclusively or almost exclusively East and Southeast Asian in distribution (an endemic species of *Tritaeniopteron* is known from Java). *Felderimyia* and *Langatia*, with both wing cell c and the stigma elongate, contain four species recorded from both Southeast Asia and West Malaysia; three further species (*Tritaeniopteron tetraspilotum*, *Proptilona decora* and *Adramoides picta*) are known from the southern part of peninsular Thailand and are likely to occur also in West Malaysia. Only a single species, the endemic *Tritaeniopteron punctatipleurum*, is known from Sri Lanka; like *T. eberneum* from Java and *T. flavifacies* from Luzon, it appears to be either an outlier or

isolated relict. Interestingly, the genus *Tritaeniopteron* has not been reported from India.

Three Sulawesian genera, *Cleitamiphanes*, *Colobostrella* and *Seraca* are clearly closely allied and probably synonymous, a possibility also noted for *Cleitamiphanes* and *Colobostrella* [as *Sophira s.s.*] by Korneyev (1999). However, they are maintained as separate genera here pending a better understanding of their relationships, both among themselves and with *Homoiothemara* and other Sundaland genera in the *Sophira* complex.

The *Acanthonevra* group of genera, *sensu* Korneyev (1999), appears to be divisible into four generic complexes rather than two distinctive subgroups: (1), the *Acanthonevra* complex as discussed by Hancock (2011b); (2), the *Sophira* complex discussed here; (3), the *Rioxa* complex, which includes at least one species [*Rioxa discalis* (Walker)] collected at cut shoots of bamboo (Permkam 1995) although its status as a host is unconfirmed; and (4), the *Dacopsis* complex, a group of primarily Australian and New Guinea genera that is known to breed beneath the bark of newly fallen trees, a niche shared with members of the tribe Phytalmiini.

The Sri Lankan genus *Sophiroides* Hendel (with its sole species *S. flammosus* Hendel) is referred to the *Rioxa* complex, together with *Cribrorioxa* Hering, *Ectopomyia* Hardy, *Hexacinia* Hendel, *Hexamela* Zia and *Rioxa* Walker.

The *Dacopsis* complex includes the genera *Austronevra* Permkam & Hancock, *Austrorioxa* Permkam & Hancock, *Copiolepis* Enderlein, *Dacopsis* Hering and *Stymbara* Walker. Several other Australian, New Guinea and Pacific genera included in the *Acanthonevra* group by Korneyev (1999) and Hancock and Drew (2003) appear to belong in the *Dirioxa* group, to which are referred *Anchiacanthonevra* Hardy, *Dirioxa* Hendel, *Griphomyia* Hardy, *Lumirioxa* Permkam & Hancock, *Micronevrina* Permkam & Hancock, *Mimoeuphranta* Hardy and *Parachlaena* Hering. As in the case of the apparently related *Themaroides* group, known larval habitats of the *Dirioxa* group include beneath the rotting bark of standing trees or in various fruits and these two groups are possibly more closely related to *Diarrhegma* Bezzi from Southeast Asia and the *Aethiothemara* group of genera from Africa than to the *Acanthonevra* group as currently recognised.

The New Guinea genus *Gressittidium* Hardy was transferred from the *Acanthonevra* group to the tribe Phascini by Hancock (2011c).

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